CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

May 2008

Technical Report No. 08-19

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of May, 2008. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

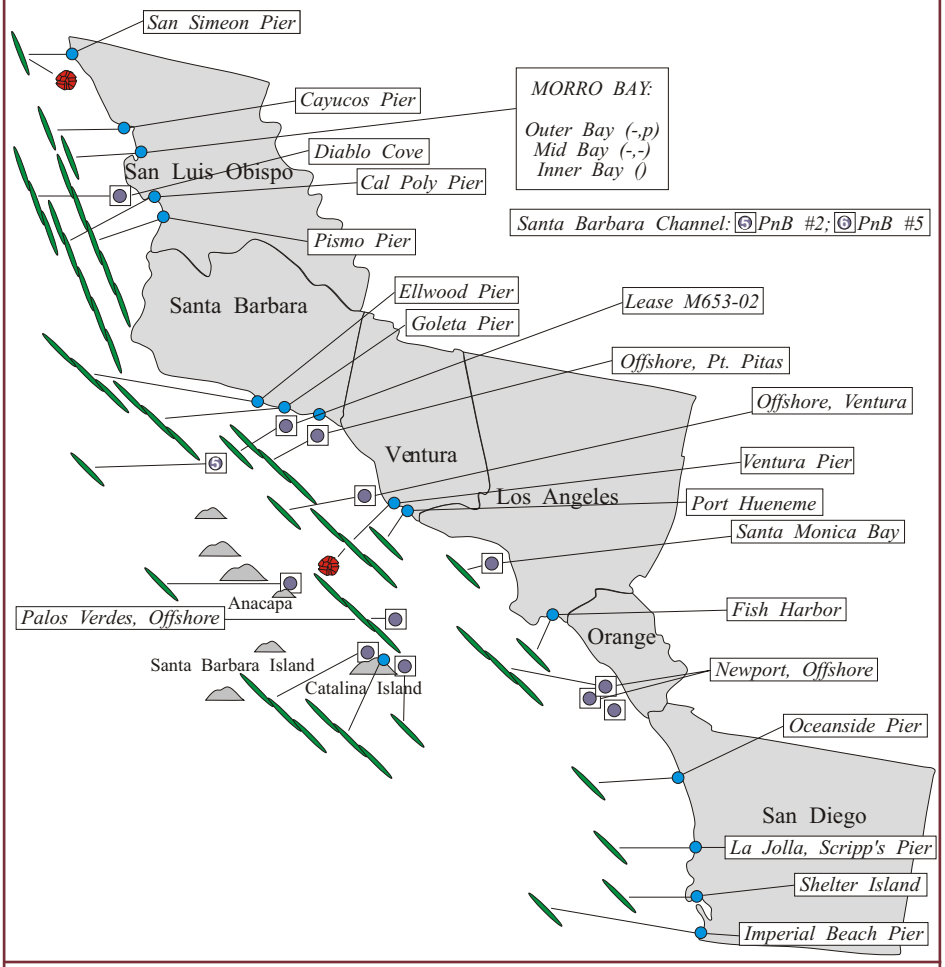
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at only two sampling stations during May (Figure 1). This dinoflagellate was present in very low numbers at San Simeon Pier (May 30) and Ventura Pier (May 19). The relative

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during May, 2008.



Relative Abundance of Known Toxin Producers

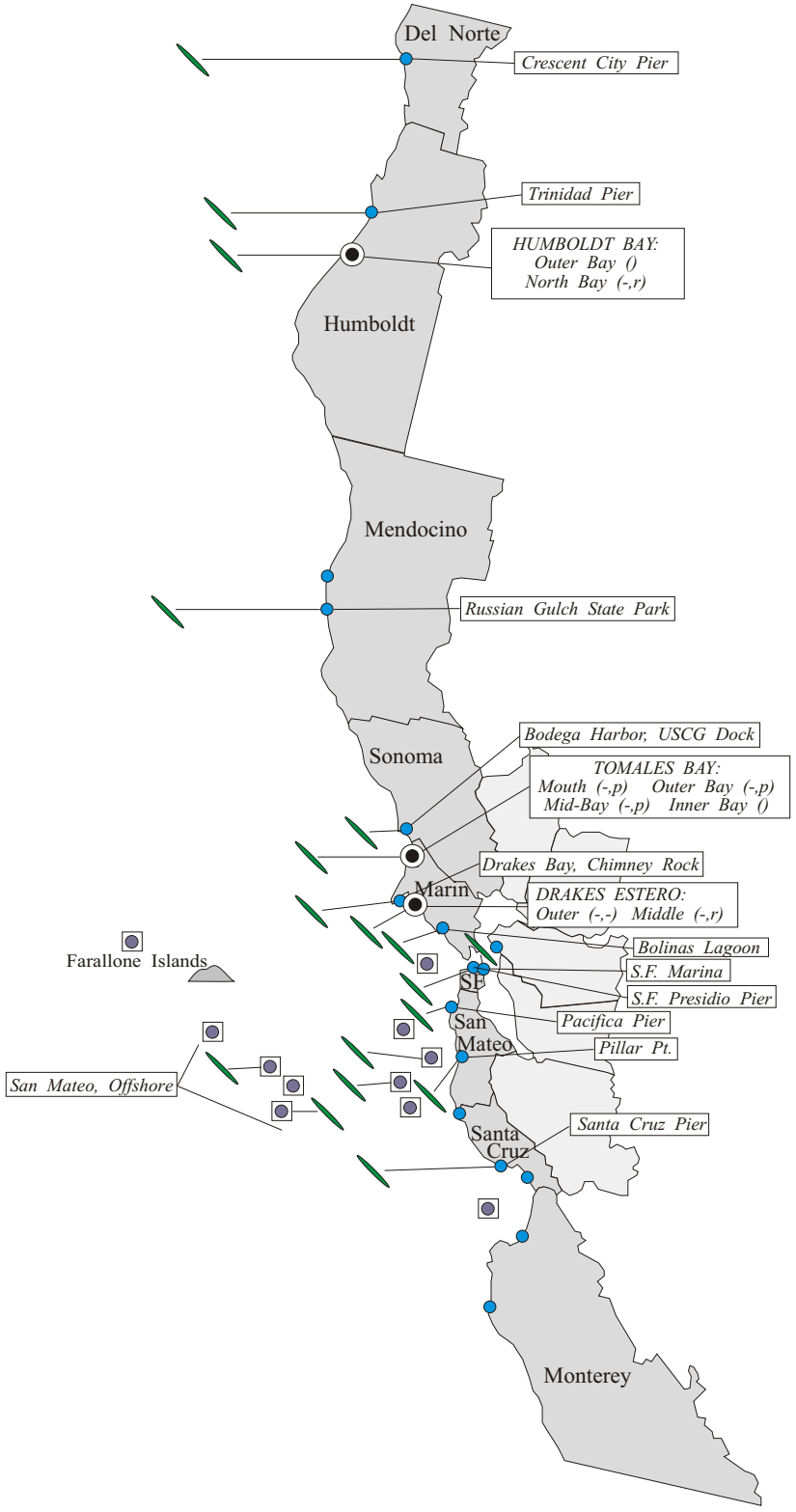
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during May, 2008.



(Continued from Page 1)

abundance was reduced from observations in April for most sites. The distribution of this dinoflagellate shifted, disappearing from sample sites in San Diego and Los Angeles and occurring northward at the San Luis Obispo site.

Low concentrations of PSP toxins continued to be detected in mussels at a number of sites along the Santa Barbara coast. A low level of these toxins was also detected in mussels from Ventura County (Figure 3). PSP toxicity declined below the alert level in mussels from Agua Hedionda Lagoon, which had continued to contain low levels of these toxins throughout April.

Domoic Acid

Pseudo-nitzschia was detected at numerous sites between San Luis Obispo and San Diego counties during May (Figure 1). The distribution of this diatom was similar to observations in April but the relative abundance increased along the San Luis Obispo coast and decreased between Santa Barbara and Orange counties. The highest relative abundances of *Pseudo-nitzschia* was observed at sites in San Luis Obispo County.

Low levels of domoic acid were detected in shellfish samples from sites in San Luis Obispo, Santa Barbara, and San Diego

(Continued on Page 3)

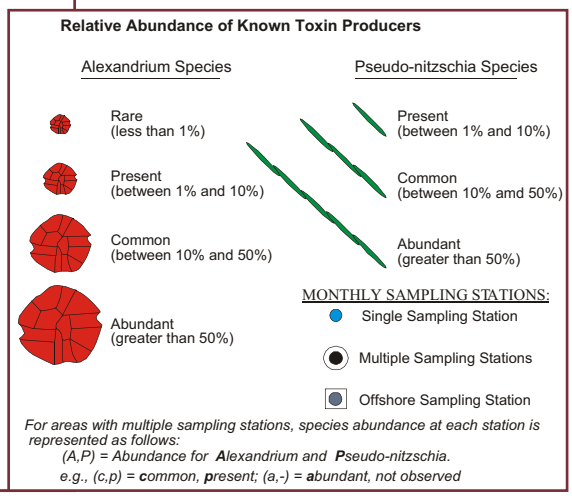
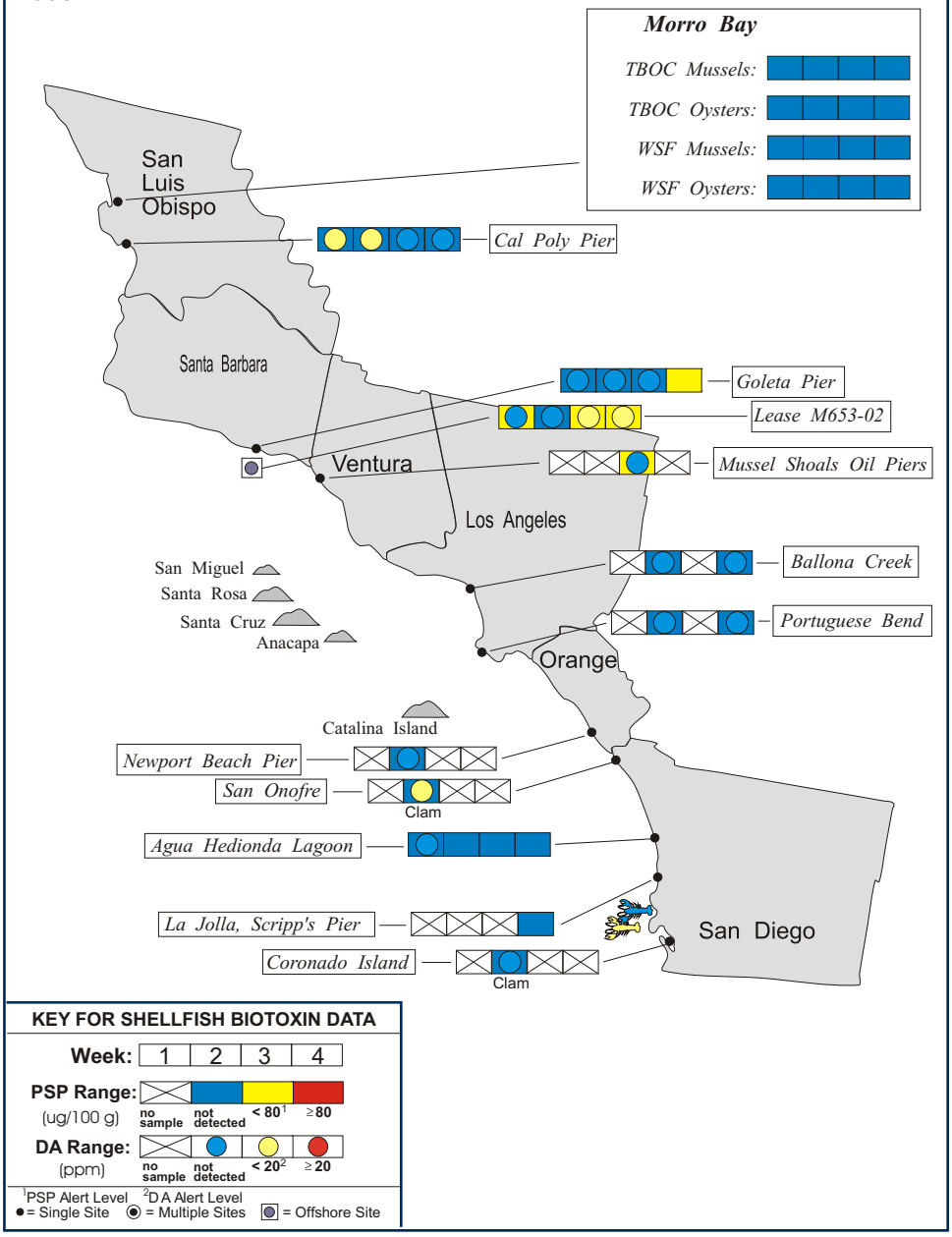


Figure 3. Distribution of shellfish biotoxins in Southern California during May, 2008.



(Continued from Page 2)

counties (Figure 3). The highest concentration detected was 9 ppm in a sentinel mussel sample from the Cal Poly Pier (San Luis Obispo County) collected on May 7. The toxin level declined to 5 ppm the following week and was nondetectable after that.

Non-toxic Species

Diatoms were dominant along the San Luis Obispo coast, with dinoflagellates dominating the coast between Ventura and San Diego counties. Santa Barbara County represented a transition zone with an equal mix of these two major groups. *Chaetoceros* and *Thalassiosira* remained the dominant diatoms. Common dinoflagellates included *Ceratium*, *Lingulodinium,* and *Akashiwo*.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any northern California sampling stations in May (Figure 2). PSP toxicity was not detected in any shellfish samples from this region during the month (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed in very low numbers at sites between Del Norte and

(Continued on Page 4)

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

(Continued from Page 3)

Santa Cruz counties in May (Figure 2). The distribution of this diatom increased compared to observations in April. A low concentration of domoic acid (2 ppm) was detected in a sample of razor clams collected at Clam Beach (Humboldt County) on May 7.

Non-toxic Species

The phytoplankton assemblage along the northern California coast was dominated by diatoms. The most common genera included *Chaetoceros* and *Thalassiosira*. *Stephanopyxis* was common at Trinidad Pier (Humboldt County) in a sample collected on May 30.

QUARANTINES:

The annual mussel quarantine went into effect on May 1. The annual quarantine applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the year, not just within the quarantine period. This allows the detection of unexpected increases in biotoxin activity outside of the routine quarantine period. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively. All certified shellfish growers are required to submit at least weekly samples of

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during May, 2008.

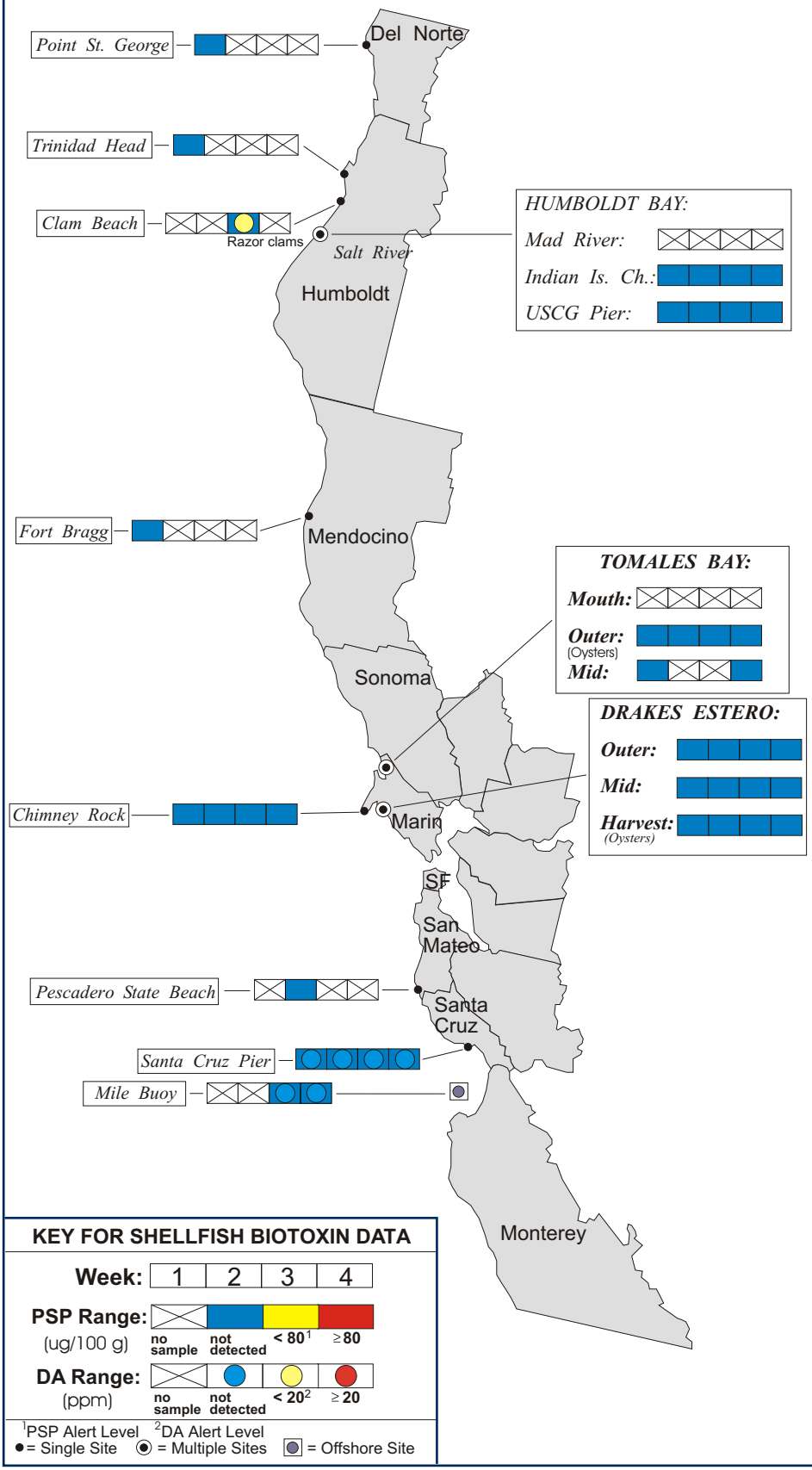


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during May, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
	California Department of Fish and Game	2
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	Marin Oyster Company	3
	CDPH Marine Biotoxin Monitoring Program	8
	Tomales Bay Oyster Company	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	U.C. Santa Cruz	2
San Luis Obispo	Cal Poly	4
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	4
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	4
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1
	CDPH Volunteer (Steve Crooke)	2

shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

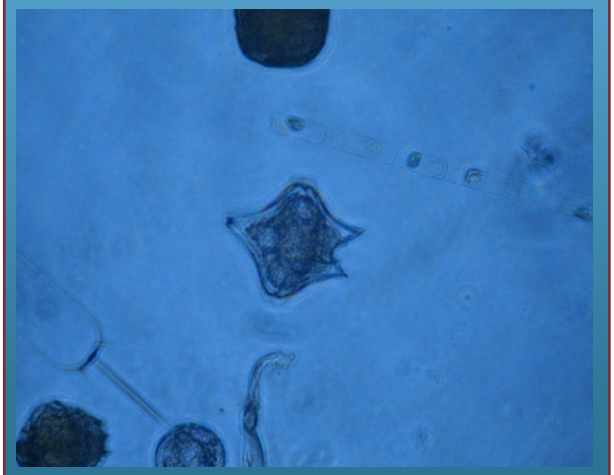
Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

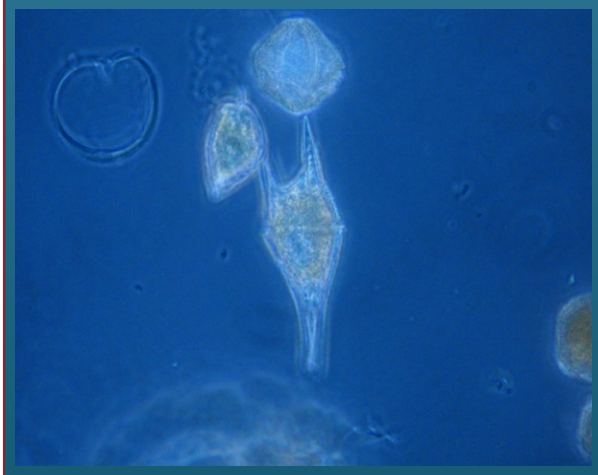
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during May, 2008.

		#
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
	California Department of Fish and Game	2
	Humboldt State University	1
Mendocino	California Department of Fish and Game	2
Sonoma	None Submitted	
Marin	CDPH Volunteer (*B. Anderson)*	5
	Drakes Bay Oyster Company	8
	CDPH Marine Biotoxin Program	4
San Francisco	CDPH Volunteer (*Eugenia McNaughton*)	3
	Gulf of the Farallones National Marine Sanctuary	2
	San Francisco Health Department	1
San Mateo	CDPH Volunteer (*Kathleen Abadie*)	3
	Gulf of the Farallones National Marine Sanctuary	8
	San Mateo County Environmental Health Dept.	1
	The Marine Mammal Center (*Stan Jensen*)	4
	U.C. Santa Cruz	1
Santa Cruz	U.C. Santa Cruz	4
	The Marine Mammal Center (*Nancy Scarborough*)	1
Monterey	Marine Life Studies	2
	Marine Pollution Studies Laboratory	3
	Monterey Abalone Company	1
San Luis Obispo	CDPH Volunteer (*Renee and Auburn Atkins*)	3
	Cal Poly	12
	Monterey Bay National Marine Sanctuary	6
	Morro Bay National Estuary Program	2
	Tenera Environmental	1
	The Marine Mammal Center (*Tim Lytsell*)	6
	Tomales Bay Oyster Company	1
Santa Barbara	CDPH Volunteer (*Sylvia Short*)	4
	Channel Islands National Marine Sanctuary	3
	Santa Barbara Channel Keeper	1
	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	4
Ventura	CDPH Volunteer (Fred Burgess)	4
	Channel Islands National Marine Sanctuary	1
	National Park Service	1
	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Sanitation District	5
	Catalina Island Marine Institute	2
	Guided Discoveries, Tole Mour	7
	Southern California Marine Institute	1
	City of Los Angeles Environmental Monitoring Div.	3
Orange	Orange County Health Care Agency	2
	Ocean Institute	1
	Orange County Sanitation District	2
San Diego	Avian Research Associates	5
	Scripps Institute of Oceanography	4
	CDPH Volunteer (*Paul Sims*)	1

PHYTOPLANKTON GALLERY



The dinoflagellate Protoperidinium is a frequent but usually minor member of the phytoplankton assemblage along the California coast.



Ceratium furca is one of the most common species of dinoflagellate observed along our coast.

The dinoflagellate Ceratium divaricatum was a common constituent of phytoplankton samples along the southern California coast.